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PRODUCT SPECIFICATIONS
SGX-BLD2

TRDU
Battery Leakage Detection Sensor

BLD2 is a Battery Failure Detection sensor that measures H2 concentration when different battery leakage occur through CAN communication.

The module has to be placed in the battery enclosure allowing to sense H2 gas generated during a failure mode.

BLD2 solution allow Battery Management System (BMS) to monitor the safe operation of the battery and send an **earlier signal** during a thermal runaway warning to give time to passengers to leave the vehicle safely.

Features:

➢ Automotive product

➢ Fast response time (<1 second)

➢ Thermal conductivity gas sensor (high reliability technology)

➢ High H2 range detection from 0 up to 10%

➢ CO gas sensor (able to detect the venting phase before Thermal Runaway)

➢ Low power consumption (50mA)

➢ CAN 500kbps High Speed communication

➢ Standard automotive 4 pins connector

➢ Watertight housing IP6K7

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1 Functional specifications

1.1 Principle

There are different failure mode during the battery life time that could occur in an Electric Vehicle.
To prevent any injury to the passengers, one solution is to send an alarm as soon as possible to the passenger to leave the car when there is any leakage detection.

Our senor is able to detect the hydrogen gas during a thermal runway and the CO gas in the venting phase that occur before a thermal runaway.
All the failure mode are cover and earlier than any other sensor like a pressure sensor.
In addition, the pressure sensor can't work in all the battery pack architectures (with a venting solution there is more or less no pressure increase detectable)

See below some failure mode examples with a comparison between H2, CO SGX sensor and a pressure sensor:

Cell Overcharge:
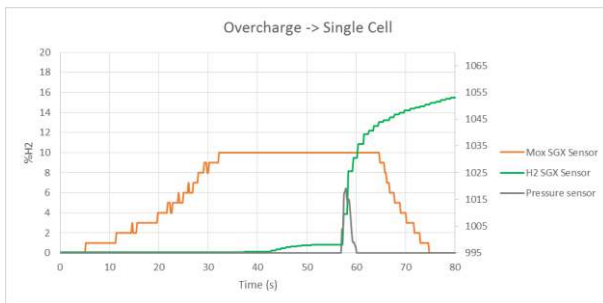
- The CO sensor (orange curve) detect a polluted event from the cell before the thermal runaway occur (it could be several minutes earlier)

- The H2 sensor (green curve) is reacting 10 seconds faster than the pressure sensor

- Small pressure increase in short period (gray curve) and similar to environment change

Cell Re-Overcharge:
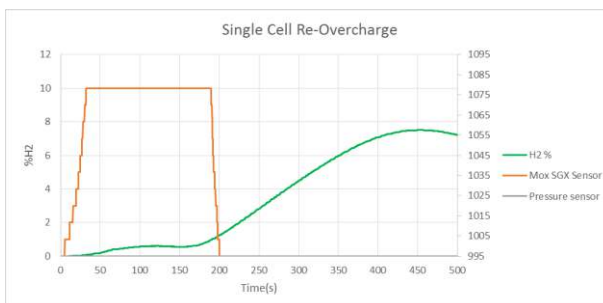
- The CO sensor (orange curve) detect a polluted event from the cell before the thermal runaway occur (it could be several minutes earlier)

- The H2 sensor is reacting (green curve).

- The pressure sensor **is not reacting** (gray curve).

Pressure sensor reference for testing: NPA-201

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1.2 Main Characteristics

Main technical characteristics	
Temperature and humidity range	0~95% RH -40°C to +85°C
Temperature storage	-40°C to 120°C
IP level	IP6K7
Fixing	Bayonet Delphi clip (optional)
Connector	4 pins Tyco Electronics AMP-1-0967640-1 coding A
External dimensions	39mm x 35mm x 27 mm
Weight	< 15 g
Power supply operating range	9 to 18V
Power consumption	<50 mA, 12V <100uA in sleep mode
Output signal	CAN 500kbps High Speed
H2 Concentration range	Minimum 10 vol.% in air Note: Inflammability level >4%
Accuracy	H2 vol.% in air ≤4% : ± 0.4 vol.% H2 H2 vol.% in air ≥4% : ± 10%
CO detection	Pollution level from 0 to 10 Based on CO concentration
Response time (T80)	<60ms
Start-up time	< 400ms
Lifetime	Minimum 10 years Minimum 13'000h

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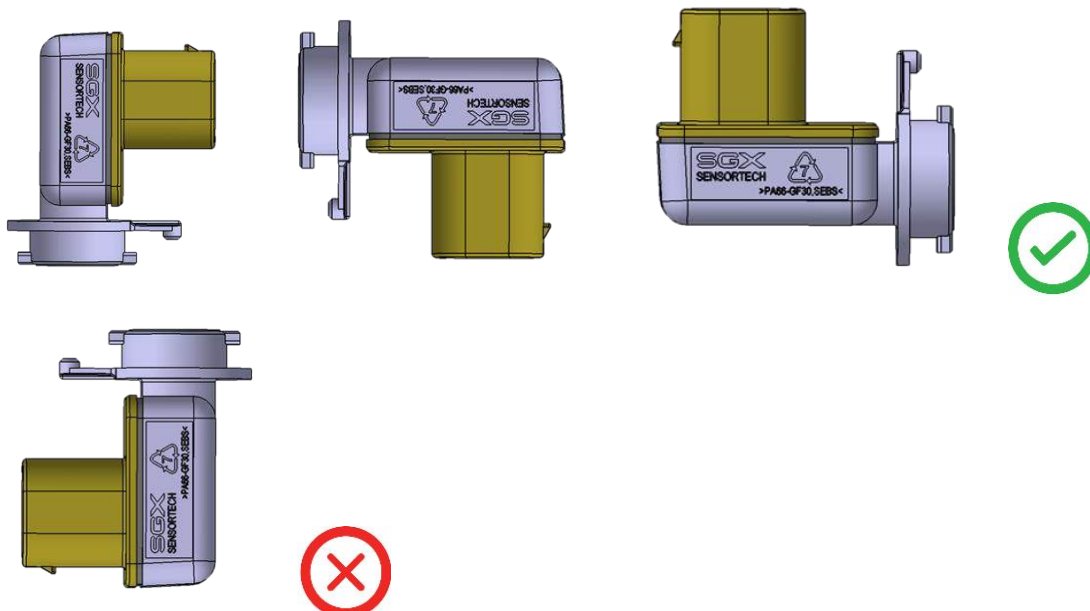# 2 Interface and integration

2.1 Connector specification

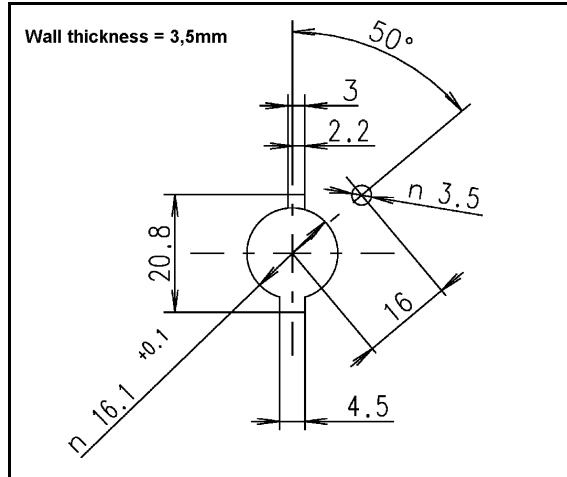| Connector type	Tyco Electronics AMP-1-0967640-1 coding A
Pinout	Pin1: Vbat Pin2: Ground Pin3: CAN Low Pin4: CAN High
CAN communication	500kbps High Speed
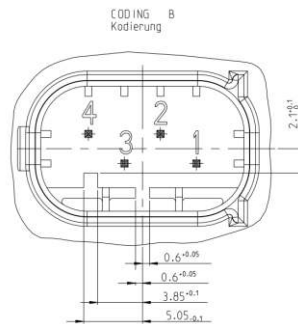
## 2.2 Recommendation for integration

The sensor must be exposed to measure the air from the battery pack only. Preferably, the filtering membrane included in the module should be facing downward. If this is not possible, it should be vertical, but should never be facing upward, to prevent accumulation of dirt, water.
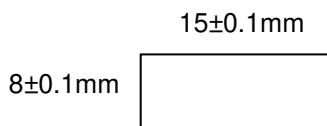
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Bayonet fixing, mating with following interface:

Optional, the sensor can be mounted with a standard Delphi-clip.
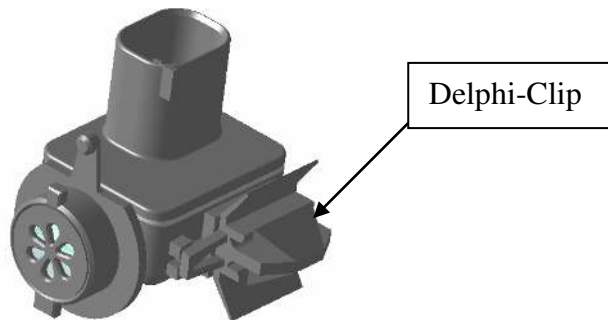
Recommended hole for Delphi-Clip

15±0.1mm

8±0.1mm

Sheet Metal Thickness (Max) 0.8 – 2.8mm

For samples availability check with your SGX Sensortech contact person.